What is claimed is:

1. An ATM (Asynchronous Transfer Mode) communication apparatus which is connected to a plurality of input lines and a plurality of output lines and transmits a cell received from each of the input lines to one of the plurality of output lines, which is specified by connection identification information included in a header of the cell, comprising:

a buffer memory for temporarily storing cells received from each of the input lines;

a write control unit for writing the cells received from each of the input lines into the buffer memory so that cells stored in the buffer memory form cell queues corresponding to connections for each output line;

a read control unit for reading out cells from each of cell queues formed in the buffer memory while guaranteeing a minimum cell rate predetermined for each connection within a range not exceeding a predetermined peak cell rate; and

means for adding congestion indication to a cell read out from a cell queue of which stored cell amount exceeds a preset threshold.

2. An ATM communication apparatus according to claim 1, wherein the read control unit comprises:

a guaranteed bandwidth table in which information for allocating time slots to each of a plurality of connections multiplexed on the output line while guaranteeing a minimum

cell rate is stored for each of the output lines;

a shared bandwidth table in which information indicative of an allocation range of idle time slots allowed to each of the connections multiplexed is stored for each of the output lines; and

means for determining a connection for which a cell is to be read out by referring to the shared bandwidth table in a time slot which enters an idle state since there is no cell to be transmitted in a cell queue in a connection designated by the guaranteed bandwidth table and an idle time slot to which a connection is not designated in the guaranteed bandwidth table.

3. An ATM communication apparatus according to claim 2, further comprising a flag table in which the presence or absence of a stored cell in each of the connections multiplexed is indicated by a flag bit for each of the output lines, wherein

a flag bit train indicative of the number of idle time slots allocatable to each of the connections multiplexed is stored as the information in the shared bandwidth table, and

the connection determining means determines a connection for which a cell is to be read on the basis of a result of an operation performed between a group of flag bits arranged in accordance with the order of connections indicated by the flag table and a group of flag bits arranged in accordance with the order of connections extracted from the shared

bandwidth table.

4. An ATM communication apparatus according to claim 2, wherein the connection determining means has means for avoiding successive allocation of idle time slots to the same connection.

5. An ATM communication apparatus according to claim 3, wherein the connection determining means has means for avoiding successive allocation of idle time slots to the same connection.

6. An ATM communication apparatus according to claim 1, wherein the write control unit has means for selectively discarding not only a received cell which becomes unable to be written into the buffer memory but also subsequent received cells belonging to the same connection as the cell failed to be written into the buffer memory.

7. An ATM communication apparatus according to claim 1, wherein the write control unit has means for selectively discarding a received cell which becomes unable to be written to the buffer memory, a cell which belongs to the same connection as the received cell and has been already stored, and a subsequent received cell belonging to the same connection as the first mentioned received cell.

8. An ATM communication apparatus according to claim 1, wherein the write control unit has means for selectively discarding received cells belonging to the same packet to which a preceding received cell which becomes unable to be written to the buffer memory belongs.

9. An ATM (Asynchronous Transfer Mode) cell forwarding control method in an ATM network including a plurality of nodes each connected to a plurality of input lines and a plurality of output lines, comprising the steps of:

writing ATM cells received from each of the input lines into a buffer memory so that stored cells form cell queues corresponding to connections for each output line at any of the nodes; and

reading out, at the ATM node, ATM cells from each of cell queues formed in the buffer memory while guaranteeing a minimum cell rate predetermined for each connection and controlling a rate so as not to exceed a predetermined peak cell rate, and transmitting each of the ATM cells to an output line corresponding to a connection after adding congestion indication to a cell which is read out from a cell queue of which stored cell amount exceeds a preset threshold.

10. An ATM cell forwarding control method according to claim 9, further comprising the steps of:

transmitting a control cell indicative of occurrence of congestion from a destination end system of the ATM cell added with the congestion indication to a source end system of the ATM cell; and

suppressing an ATM cell transmission amount by the source end system which has received the control cell.